

**REMARKS**

This amendment is in response to the Official Action mailed on June 28, 2006, the statutory period for responding with a three-month extension of time being set to expire on December 28, 2006. Claims 1-2, 5-8, 12 and 15-19 are currently pending in the application. Claim 4 was cancelled previously.

**I. 35 U.S.C. § 102 REJECTION**

The Examiner has rejected claims 1-2, 4, 8 and 17-18 under 35 U.S.C. § 102, in view of U.S. Patent No. 4,599,116 to King ("King"). The Examiner contends that all of the limitations are currently taught by King. For the following reasons, Applicants respectfully disagree with the Examiner's assertions.

**A. King Fails To Teach or Disclose The Use Of Pure Water Together with Neutralizing Chemical liquid**

Claim 1, in part, recites "continuously feeding pure water to the rinse bath so as to rinse off the cleaning chemical liquid from a surface of the object" and "adding a neutralizing chemical liquid, which has alkalinity or acidity opposite to that of the cleaning chemical liquid, to the pure water in the rinse bath." The claimed invention teaches the addition of a neutralizing chemical liquid to neutralize the cleaning chemical liquid during the continuous feeding of the pure water. The specification in paragraph 36 at page 8 explains that the addition of the neutralizing chemical liquid to the pure water reduces the amount of pure water that is used in rinsing the cleaned object. King is not concerned with reducing the amount of pure water used.

King does not even teach use of "pure water." Instead, King uses deionized water. In applying King, the Examiner assumes that the deionized water is same as the "pure

water" without pointing to any support for the assumption. The Applicants urge that deionized water is not same as the pure water. Since deionized water is not same as pure water, King fails to teach or disclose all elements of claim 1. Therefore King does not anticipate claim 1. Claims 2 and 17 depend from claim 1 and are not anticipated at least for same reasons as claim 1.

Claim 8, in part, recites, "continuously feeding pure water to the rinse bath so as to rinse off the cleaning chemical from a surface of the cleaned object" and "adding a neutralizing chemical which has alkalinity or acidity opposite to that of the cleaning chemical to the pure water in the rinse bath." Claim 8 is not anticipated by King for same reasons discussed in context of claim 1. Claim 18 depends from claim 8 and is not anticipated at least for same reasons as claim 8.

In response to Applicants arguments in preceding response, the Examiner argued that specification does not define pure water. The Applicants respectfully disagree. The specification clearly and unambiguously states at paragraph 40 that "theoretical ultra pure water has a resistivity of about 18.25 MΩ.cm." In paragraph 42, the specification further teaches that "completion of rinsing of a silicon wafer is judged by whether a resistivity of pure water in a rinse bath is restored to a level of about 10 MΩ.cm." Thus, the specification clearly provides a measure to define "pure water."

**B. King Fails To Teach the Neutralization of the Cleaning Chemical Liquid**

In contrast to Applicants' claimed invention, King teaches the neutralization of the rinse water. King states that the rinse solution is progressively contaminated by remnants of the alkaline cleaning solution carried over by the cleaned containers. In order to avoid alkalinity in the subsequent

rinse stages, the pH of the rinse solution must be maintained at about a pH of 7.5 or below. Maintaining the rinse solutions at this pH level substantially eliminates the formation of brown stains on the aluminum container bodies that is generally caused by rinsing with alkaline rinse water. See Col.7, 11.17-37. King therefore focuses on the neutralization of the rinse water, and not the neutralization of the cleaning chemical liquid, such as in Applicants' claimed invention. Accordingly, Applicants respectfully contend that King fails to teach this limitation.

For the reasons set forth above, Applicants contend that the Examiner's rejections of claims 1-2, 8 and 17-18 are overcome. Consequently, Applicants contend that for these reasons, and the reasons set forth below, claims 1-2, 8 and 17-18 are in condition for allowance.

## **II. 35 U.S.C. § 103 REJECTION**

The Examiner has rejected claims 1-2, 5-8, 12, and 15-18 under 35 U.S.C. § 103, in view of U.S. Patent No. 5,656,097 to Olesen ("Olesen"). For the reasons stated below, Applicants contend that Olesen fails to teach, disclose or suggest several of the limitations of Applicants' claimed invention.

### **A. Olesen Fails To Teach, Disclose or Suggest The Use Of Pure Water**

Olesen, just like King uses deionized water. Deionized water is not the same as pure water. There is no teaching, disclosure or suggestion in Olesen or any other place that the Examiner has cited to show that deionized water is same as pure water. Therefore, Olesen fails to teach disclose or suggest all elements of claims 1 and 8 as discussed previously in the context of 35 U.S.C. § 102 rejection. Therefore, claims 1-2, 5-8, 12, and 15-18 are not obvious over Olesen at least for failing to teach, disclose or suggest use of "pure water."

**B. Olesen Fails To Teach "Neutralizing The Cleaning Chemical Liquid With The Neutralizing Chemical Liquid"**

Claim 1 requires the addition of a neutralizing chemical liquid opposite to that of the cleaning chemical liquid to produce a salt by "neutralizing the cleaning chemical liquid with the neutralizing chemical liquid."

In contrast, Olesen does not teach neutralizing the cleaning chemical liquid used to clean the wafer with a corresponding neutralizing chemical liquid.

Olesen teaches cleaning wafers in various cycles, including Vc1 and Vc2. In the Vc1 cycle, chemical additives are used to clean the wafer and megasonic energy is applied to the interior of the tank. The purpose of applying megasonic energy is to loosen particles on the wafer. "By utilizing the megasonic system, with standard cleaning solutions, films and adsorbed contaminants are removed at the same time that particles are being removed by the megasonic energy." See Col.2 11.25-40.

In the Vc2 cycle, hydrofluoric acid in the form of buffered oxide etchant is injected into cold DI water to remove native oxides from a wafer, and not to neutralize the chemical liquid that is used to clean the wafer. As stated in Col.11, 11.32-35, "[t]he Vc2 cycle solution acts to strip the oxide from the wafers, removing metals which are less electro-negative than silicon." In this regard, the solution is not used to neutralize the cleaning chemical liquid, but rather to remove oxides on the wafers. Thus, Applicants respectfully contend that Olesen does not teach, disclose or suggest this limitation. Therefore, Olesen does not make claim 1 obvious.

Claim 8 requires "reacting the neutralizing chemical and the residual cleaning chemical." The Applicants respectfully contend that Olesen does not teach, disclose or

suggest this limitation. Therefore, Olesen does not make claim 8 obvious for same reasons as discussed above in the context of claim 1. Claims 2 and 5-7 depend either directly or indirectly from claim 1, and claims 12, 15 and 16 depend either directly or indirectly from claim 8. Therefore, claims 2, 5-7 and claims 12, 15, 16 are not obvious over Olesen at least for same reasons as claims 1 and 8 respectively.

For the reasons set forth above, Applicants respectfully contend that the Examiner's rejections of claims 1-2, 5-8, 12, and 15-16 are overcome. Applicants therefore respectfully assert that these claims are also in condition for allowance.

**C. Kennison et al. Cannot Be Combined With King Or Olesen**

Kennison et al. teaches rinsing with purified water alone. Kennison et al. does not teach, disclose or suggest adding neutralizing chemical to the purified water. Additionally, there is no suggestion to replace deionized water of King or Olesen with purified water of Kennison et al or adding neutralizing chemical to the purified water of Kennison et al. Therefore teachings of Kennison et al. cannot be combined with Olesen. Since Kennison et al. cannot be combined with Olesen, claims 13-14 and 19 cannot be obvious over such impermissible combination. Therefore, claims 13-14 and 19 are not obvious over Olesen in view of Kennison et al.

**111. 35 U.S.C. § 112, second paragraph**

Claim 19 has been amended to replace "xcm" by ".cm" as suggested by the Examiner to overcome the rejection of claim 19 under 35 U.S.C. § 112, second paragraph.

**IV. CONCLUSION**

As it is believed that all of the rejections set forth in the Official Action have been fully met, favorable reconsideration and allowance are earnestly solicited.

If, however, for any reason the Examiner does not believe that such action can be taken at this time, it is respectfully requested that he telephone Applicants' attorney at (908) 654-5000 in order to overcome any additional objections which he might have.

If there are any additional charges in connection with this requested amendment, the Examiner is authorized to charge Deposit Account No. 12-1095 therefor.

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Respectfully submitted,

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